

3.6 ENERGY USE

This section describes the existing energy consumption associated with the project site. The study area for the analysis of energy use and conservation includes existing residential and social service uses, as well as the proposed residential and non-residential buildings.

3.6.1 Affected Environment

Seattle City Light, a municipal electric utility serving the City of Seattle and portions of King County outside the city limits, provides electricity to the site. Puget Sound Energy provides natural gas service. Please refer to *Section 3.14. Public Services and Utilities* for additional information regarding service providers and facilities.

Winter is the peak season for electricity use in the Puget Sound area. The winter peak electricity load at the Duwamish Substation is approximately 240 megawatt-hour (MWH). The summer peak load is less – 210 MWH. The substation has a capacity of 294 megavolt-amperes (MVA) during the winter months, or approximately 294 MWH, when referring to residential electrical energy use. The substation yields a slightly lower capacity of 257 MWH during the summer, due to the decreased ability to transfer electricity into heat at warmer temperatures. The net seasonal capacity ranges from 47 to 54 MWH, or 47,000 to 54,000 KWH.¹

The average home generates an estimated load of 3 to 5 KVA. By equating capacity in terms of the number of homes, there is currently enough capacity for 60,000 homes. By subtracting the peak winter load generated by the existing residential, commercial, and industrial uses (240 MWH) from the peak substation capacity (294 MWH), there would be enough remaining capacity for approximately 10,800 homes.²

Seattle City Light (SCL) projects that the current capacity at the Duwamish Substation will accommodate growth in the service area through 2005. Over the next 10 years, SCL plans to provide additional capacity. Investments are planned for a new transformer and substation bus.

Seattle City Light estimates that the average Seattle-area single family home using electricity for heating and regular use, consumes approximately 18,500 KWH per year (Tachibana, SCL, personal communication, 2003). Given the age, condition, and energy inefficient nature of the existing residences, energy use would likely be higher.

Currently, residential and non-residential units consume electricity for heat and other energy needs. The Head Start and the Food Bank buildings consume both natural gas and electricity. Please see **Tables 3.6-1** and **3.6-2**.

¹ Smith, Seattle City Light, personal communication, 2003.

² Ibid.

Table 3.6-1
EXISTING RESIDENTIAL ELECTRICAL ENERGY USE PER UNIT TYPE¹

Number of Units (569 in all) ²	Unit Type	Average Summer Usage (KWH) Per Unit	Average Winter Usage (KWH) Per Unit	Average Annual Usage (KWH) Per Unit	Total Annual Usage (KWH) All Units
53	1-bedroom	2,753	4,581	7,334	388,702
354	2-bedroom	5,120	10,354	15,474	5,477,796
147	3-bedroom	5,871	11,388	17,273	2,539,131
15	4-bedroom	7,753	13,345	21,098	316,470
Total Energy Use (KWH) All Units		2,937,721	5,782,320	---	8,722,099
Total Energy Use (Btu)³ All Units		100.24 × 10⁸	197.30 × 10⁸	---	297.61 × 10⁸ Btu

Source: Prepared from data provided by Seattle City Light, 2001 and 2002.

Notes:

¹ Averages were determined by sampling the energy use of three residential addresses from each unit type for 2001 and 2002. Summer refers to the months from April through September; winter includes October through March. Data for individual seasons may not equal annual totals due to adjustments for incomplete billing data.

² Units are equipped with forced-air furnace heating systems.

³ 1.0 Btu equals 2.93071 × 10⁻⁴ KWH or 1.0 × 10⁻⁵ therms.

Based on information from 2001 and 2002, the average annual electricity consumption in KWH for the Park Lake Homes residences ranged from 7,334 for a one-bedroom unit to 21,098 for a four-bedroom unit. Annual combined electricity usage for all 569 residences is approximately 8,722,099 KWH, or 297.61 × 10⁸ British Thermal Units (Btu, a standard energy unit). Electricity usage during the winter months (from October through March) was nearly double that of summer usage (from April through September).³

Table 3.6-2
EXISTING NON-RESIDENTIAL GAS AND ELECTRICAL ENERGY USE

Energy Type	Average Summer Usage	Average Winter Usage	Average Annual Energy Usage
Natural Gas (therms) ¹	285	1,654	1,939
Electricity (KWH) ²	318,869	613,959	932,828
Total Energy Use (Btu) ³	11.165 × 10⁸	22.603 × 10⁸	33.768 × 10⁸

Source: Prepared from data provided by King County Housing Authority, 2002.

Notes:

¹ Includes the following non-residential facilities: Community Center, Head Start, and Food Bank energy use.

² Includes unoccupied dwelling units (5 total) and all non-residential facilities.

³ 1.0 Btu equals 2.93071 × 10⁻⁴ KWH or 1.0 × 10⁻⁵ therms.

Figures from 2002 indicate energy consumption for the remaining buildings at 932,828 KWH of electricity (see Table 3.6-2). The Community Center requires the largest amount of electricity of

³ Katayama, SCL, personal communication, 2003.

the buildings – approximately 471,200 KWH annually, or 50 percent – followed by the maintenance shop at 34 percent. The non-residential buildings also consume 1,939 therms of natural gas (unit of natural gas consumption).

In all, the entire project site consumes approximately 331.38×10^8 Btu of energy. Of this amount, natural gas consumption comprises 1.9385×10^8 Btu and electrical consumption comprises the remaining 329.44×10^8 Btu.